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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants: I. NISHIZAWA, et al

Serial No.: 09/435,034

Filed: November 5, 1999

For: DATA WAREHOUSE SYSTEM AND QUERY PROCESSING
METHOD USED IN THE SYSTEM, AND DATA COLLECTING
METHOD AND APPARATUS FOR THE METHOD, AND
CHARGING METHOD AND APPARATUS IN THE SYSTEM

Group: 2167

Examiner: L. S. Wassum

APPEAL BRIEF

MS Appeal Briefs - Patents

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

January 5, 2006

Sir:

This Appeal Brief is being filed in response to the decision by the Examiner in the final Office Action dated February 3, 2005 in which claims 35-37 were finally rejected. In accordance with 37 CFR §41.37, the Appellant provides the following.

I. REAL PARTY IN INTEREST

The Real Party in Interest in this Appeal is Hitachi, Ltd., as evidenced by the Assignment filed on November 5, 1999 in Application Serial No. 09/435,034, filed November 5, 1999, said application being the subject of this Appeal, and recorded on Reel 010387 and Frame 0099.

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II. RELATED APPEALS AND INTERFERENCE

There are no other Appeals or Interferences that may directly affect, may be directly affected by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 35-37 are currently pending. Claims 35-37 stand rejected under 35 USC §103(a) as being unpatentable over Rabinovich (U.S. Patent No. 6,256,675) in view of Olson (U.S. Patent No. 5,995,980) and in view of Hammond (U.S. Patent No. 5,758,337).

IV. STATUS OF AMENDMENTS

All of the previously filed amendments have been entered. No amendments have been filed subsequent to the final rejection.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention as recited in the claims is directed to a data warehouse system having a plurality of client servers each for accepting a processing request from each user thereof, a server provided with a database and used for searching the database according to access requests from the client devices, a data collector, which is separate from the server and associated with the client devices and is provided with a storage device, for collecting data requested by users of the client devices and storing the data

into the storage device as a replica which is partially replicating the database, and a network for connecting the client devices to the server respectively via the data collector.

According to the present invention the data collector includes a replica creation control means for determining whether a new replica of the database is to be created and stored in the storage device, in response to a replica creation request from one of the client devices, by referring to a replica management table which holds at least a data range and a data updating interval of each replica stored in the storage device, a query analysis unit for analyzing a query processing request from of the client devices to select, as an object to be searched, a replica stored in the storage device or the database, a query processing unit for searching the replica stored in the storage device according to a query analyzing result from the query analysis unit a communication control unit for selecting a procedure for accessing the server according to the query analysis result.

Further, according to the present invention the server includes a communication control unit for receiving the query analysis result transmitted from the data collector and a query processing unit for searching the database of the server.

Alternatively, the data warehouse system as described above could, for example, include all of the elements recited above with the exception that a plurality of data collectors are provided each being separate from the server and associated with at least one of the client devices, and each for collecting data requested by a corresponding user and storing the data in the storage device as a replica partially replicating the database. Each of the data

collectors can, for example, include a replica creation control means, a query analysis unit, a query processing unit and a communication unit performing the same functions as described above.

As set forth in the claims, a replica management table as illustrated in Fig. 8 holds at least a data range 801 and data updating interval 803 of each replica stored in a storage device 112 as illustrated in Fig. 1 of the present application. A replica creation request is issued from a client device 103 to a data collector 101. The data collector 101 has a replica creation control means 106, 107 which determine whether a new replica is to be created by referring to the replica management table and a storage device 112 which stores the new replica that were created. If the data range and the data updating interval of the requested replica meet those of a stored replica, a new replica is not created. These features of the present invention are described, for example, on page 19, lines 5-11 of the present application.

Thus, according to the present invention the data collector 101 is a type of data cache as described on page 22, line 20 through page 29, line 23 of the present application. The data collector 101 of the present invention transfers a request for making a replica of data stored in a storage unit 121. Thus, according to the present invention data from the replicas in each server are collected and stored in the storage unit 112, so as to form a new replica if such does not already exist. Clients then may first access the storage unit 112 for desired data. Therefore, according to the present invention it is possible to have data 123 shared among clients 103, 104, thereby reducing the load on the server. These features of the present invention are described, for example, on page 30, lines 1-14 of the present application.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 35-37 are unpatentable over Rabinovich in view of Olson and Hammond under 35 USC §103(a).

VII. ARGUMENT

A. 35 USC §103(a) rejection of claims 35-37

The features of the present invention as recited in the claims are not taught or suggested by Rabinovich whether taken individually or in combination with any of the other references of record particularly Olson and Hammond.

Rabinovich teaches a system and method for distributing requests for objects to hosts that store replicas of the objects and for managing the placement of the replicas among the hosts. The system taught by Rabinovich as illustrated, for example, in Fig. 1 thereof provides a request distributor 101 being connected to a network 102 to which hosts 103, 104 and 105 are also connected. Each hosts 103, 104 and 105 stores a replica of an object.

As taught by Rabinovich, a request for an object is received at the request distributor 101 which determines the value of a request matrix which is a historical measure of the request for the object that have been forwarded to the host that stores the replica, and a distance metric which is a measure of the cost of communicating between the requestor and the host. The request distributor 101 then selects a host that stores a replica of the requested object to respond to the request based upon the request metric and the distance metric.

As per the above, Rabinovich teaches in col. 8, lines 7-49 thereof that the distribution of requests for replicas to the hosts are managed based on the closest host, as indicated by a distance metric, and a request metric for each host as illustrated in Fig. 4. In other words in Rabinovich requests for replicas are managed by considering the load of each of the hosts and the distance of the host from the requester. Thus, there is no teaching or suggestion in Rabinovich of the above described features of the present invention as recited in the claims.

Particularly, Rabinovich fails to teach or suggest the data collector as recited in the claims. In the Office Action the Examiner alleges that the request distributor 101 corresponds to the data collector, yet the Examiner seems to refer to the functions performed in each host (server) 103 regarding the replica stored therein as corresponding to the functions and elements recited in the claims with respect to the data collector. However, the replica management instructions 113 and replica 115 as provided in the server 103 are in fact fully integrated functions performed by the server 103. The request distributor 101 as taught by Rabinovich merely distributes requests from a requestor 109 to the servers 103, 104 and 105 and as such does not perform any replication functions as recited in the claims.

Thus, at no point is there any teaching or suggestion in Rabinovich of a data collector which performs the replication functions and that the data collector is separate from the server as now more clearly recited in the claims.

Further, there is no teaching or suggestion in Rabinovich that the data collector is provided with a storage and that such storage stores the replica of a database which is provided as part of the server. In Rabinovich the request

distributor 101 contains a memory but such memory simply stores request distribution instructions 108. Rabinovich teaches servers 103 but each server 103 has a memory 112, a replica 115 and replica management instructions 113. Thus, in Rabinovich the replica is stored in the server rather than at the data collector as in the present invention as recited in the claims.

Therefore, Rabinovich fails to teach or suggest numerous features of the present invention as recited in the claims particularly with regard to the data collector, which is separate from the server and associated with the client devices and is provided with a storage device, for collecting data requested by users of the client devices and storing the data in the storage device of the data collector as a replica which is partially replicating the database provided in the server.

Further, since Rabinovich fails to teach or suggest any elements corresponding to the data collector as recited in the claims it follows that Rabinovich does not teach or suggest the elements which form a part of the data collector including the replica creation control means, query analysis unit, query processing unit and communication control unit as recited in the claims.

In the Office Action the Examiner points to alleged teachings of these elements in Rabinovich. However, upon review of these alleged teachings in Rabinovich it is quite clear that many of these functions and operations do not correspond to the functions performed by the various elements forming a part of the data collector and in fact are performed by different elements other than the alleged data collector as asserted by the Examiner. In other words, the request distributor 101 of Rabinovich does not include any of these elements namely the replica creation control means, query analysis unit, query

processing unit and communication control unit which forms a part of the data collector nor does it perform any functions corresponding to these elements as in the present invention as recited in the claims.

The above described deficiencies of Rabinovich are not supplied by any of the other references of record namely Olson and Hammond. Therefore, combining the teachings of Rabinovich and Olson and Hammond in the manner suggested by the Examiner in the Office Action still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Olson is directed to a system and method for updating a database or other data compilations with changes entered in a source database or data compilation. As taught by Olson, for example, in Figs. 1 and 2 thereof, target databases 22 are updated with update packages 30 respectively such that each update package 30 is adapted and created by an update system 32 for direct application through an apply machine 31 to the corresponding target database 22.

The Examiner relies upon Olson for an alleged teaching of a data warehouse system where the object corresponds to databases. Thus, the Examiner recognizes the deficiencies of Rabinovich relative to the features of the present invention as recited in the claims. In fact, the Examiner states that:

"Rabinovich does not explicitly teach an implementation of the data warehouse system where the objects correspond to databases".

Yet the Examiner says that these acknowledged deficiencies of Rabinovich are supplied by Olson. Thus, in the Office Action the Examiner makes a completely unsupported allegation that:

“it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the replica management and query distribution functions as taught by Rabinovich to a partially replicated database system such as that taught by Olson et al, since replicated databases reduce contention for access to a primary database, as well as providing a backup in the event of media failure (see col. 1, lines 17-26)”.

It seems that the Examiner has not properly made a *prima facie* case of obviousness when combining two references which apparently disclose non-analogous art, Rabinovich teaching a system and method for allocating requests for objects and managing replicas of objects on a network and Olson teaching a system and method for database update replication. The Examiner must show with convincing evidence within the references themselves, particularly when they are each directed to non-analogous art, some objective teaching in the art that would have lead one of ordinary skill in the art to combine the references in the manner suggested by the Examiner.

In the Office Action, the Examiner merely points to an object or a goal of the system and method taught by Olson as support for his allegation that Rabinovich and Olson can be combined. This teaching in Olson is merely a goal of replicated databases and as such this teaching but does not necessarily confer to the system and method taught by Rabinovich, which is allocating requests for objects on a network, how the respective teachings can be combined and how the teaching in Olson supplies the acknowledged deficiencies and recognized disadvantages of Rabinovich. True evidence that

Rabinovich can be combined with Olson would have stated, for example, that the system and method for database update replication as taught by Olson could be applied to a system and method for allocating requests for objects on a network as taught by Rabinovich. No such teaching can be found at any point in Olson and therefore combining Rabinovich and Olson in the manner as alleged by the Examiner would not have been done by one of ordinary skill in the art.

Thus, the Examiner has not identified any objective teaching in either of Rabinovich or Olson that would have lead one of ordinary skill in the art to combine the references in the manner as alleged by the Examiner in the Office Action. Therefore, Appellants' submit that Rabinovich and also cannot be combined in the manner suggested by the Examiner in the Office Action. However, even if Rabinovich and Olson can be combined, the combination does not supply any teaching which renders obvious the features of the present invention as recited in the claims. Namely, there is no teaching or suggestion based upon the combination of Rabinovich and Olson of a data warehousing system where the objects correspond to databases and including a data collector as recited in the claims.

Hammond is directed to a system for creating database partial replicas where the referential integrity of the original database is maintained in the partial replicas. Hammond is merely relied upon by the Examiner for an alleged teaching of a system wherein definitions of the partial replicas are stored in a table. Appellants do not agree that Hammond teaches such features in a manner so as render obvious the alleged corresponding features as recited in the claims. However, even if Hammond does teach such

features, Hammond does not supply the numerous deficiencies relative to the features of the present invention as recited in the claims that are not supplied by Rabinovich and Olson. Therefore, combining Rabinovich, Olson and Hammond in the manner suggested by the Examiner still fails to teach or suggest the features of the present invention as clearly recited in the claims.

Thus, there is no teaching or suggestion in Rabinovich, Olson or Hammond whether taken individually or in combination with each other of a data collector which performs the replication functions and that the data collector is separate from the server as recited in the claims.

Further, there is no teaching or suggestion in Rabinovich, Olson or Hammond whether taken individually or in combination with each other that the data collector is provided with a storage and that such storage stores the replica of a database which is provided as part of the server as recited in the claims.

Still further, there is no teaching or suggestion in Rabinovich, Olson or Hammond whether taken individually or in combination with each other that the (data collector, which is separate from the server and associated with the client device and provided with the storage device collects data requested by users of the client devices and stores the data in the storage device as replica which is partially replicating the database as recited in the claims.

Still further yet, there is no teaching or suggestion in Rabinovich, Olson or Hammond whether taken individually or in combination with each other that the data collector includes a replica creation control means for determining whether a new replica of the database is to be created and stored in the storage device, in response to a replica creation request from one of the client

devices, by referring to a replica management table which holds at least a data range and a data update integral of each replica stored in the storage device as recited in the claims.

Even further, there is no teaching or suggestion in Rabinovich, Olson or Hammond whether taken individually or in combination with each other that the data collector also includes a query analysis unit for analyzing a query processing request from one of the client devices to select, as an object to be searched, a replica stored in the storage device or the database, a query processing unit for searching the replica stored in the storage device according to a query analysis result from the query analysis unit, and a communication control unit for selecting a procedure for accessing the server according to the query analysis result as recited in the claims.

Even further still, there is no teaching in Rabinovich, Olson or Hammond whether taken individually or in combination with each other that a server which includes a communication control unit for receiving the query analysis result transmitted from the data collector, and a query processing unit for searching the database of the server as recited in the claims.

B. Claim 36

Claim 36 is similar to claim 37 with the exception that a plurality of data collectors are provided. As recited in claim 36 the data collectors are separate from the server and each data collector is associated with at least one of the client devices and collects data requested by a corresponding user. Since there is no teaching or suggestion in any of the references of record, namely Rabinovich, Olson and Hammond, of a data collector it follows that

such references whether taken individually or in combination with each other do not teach or suggest a data warehouse system having a plurality of said data collectors as recited in claim 36.

C. Claim 37

Claim 37 depends from claim 36 and recites a further feature that the replica management table holds additional replica descriptions including data range, a data updating interval and a location of replica stored in the storage device of cooperative data collectors and that the replica creation control means determines whether a new replica of the database is to be created and stored or not by further referring to additional replica descriptions. These features are not taught or suggested by any of the references of record namely Rabinovich, Olson and Hammond whether taken individually or in combination with each other. It should be noted that this claim specifically recites that the replica management table includes, for example, a location of each replica stored in the storage device of cooperative data collectors. Thus, this feature of claim 37 is directed to multiple data collectors corresponding to the plural of data collectors recited in claim 36 from which claim 37 depends. Such features are clearly not taught or suggested by Rabinovich, Olson and Hammond whether taken individually or in combination with each other.


D. Conclusion

Therefore, based on the Appellants submit that the Examiner's final rejection of claims 35-37 under 35 USC §103(a) as being unpatentable over Rabinovich in view of Olson and Hammond is not properly founded in law and respectfully request that the Board of Patent Appeal Interferences reverse the Examiner's final rejection.

To the extent necessary, applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1417 (Case No. 501.37841X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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Enclosures

VIII. CLAIMS APPENDIX

Claims 1-34 (canceled).

35. A data warehouse system, comprising:

a plurality of client devices, each for accepting a processing request from each user thereof;

a server provided with a database and used for searching said database according to access requests from said client devices;

a data collector, which is separate from said server and associated with said client devices and is provided with a storage device, for collecting data requested by users of said client devices and storing the data into said storage device as a replica which is partially replicating said database; and

a network for connecting said client devices to said server respectively via said data collector,

wherein said data collector comprises:

a replica creation control means for determining whether a new replica of said database is to be created and stored in said storage device, in response to a replica creation request from one of said client devices, by referring to a replica management table which holds at least a data range and a data updating interval of each replica stored in the storage device,

a query analysis unit for analyzing a query processing request from one of said client devices to select, as an object to be searched, a replica stored in said storage device or said database,

a query processing unit for searching said replica stored in said storage device according to a query analysis result from said query analysis unit, and

a communication control unit for selecting a procedure for accessing said server according to said query analysis result, and

wherein said server comprises:

a communication control unit for receiving said query analysis result transmitted from said data collector, and

a query processing unit for searching the database of said server.

36. A data warehouse system, comprising:

a plurality of client devices, each for accepting processing a request from each user thereof;

a server provided with a database and used for searching said database according to access requests from said client devices;

a plurality of data collectors which are separate from said server, each data collector being associated with at least one of said client devices and each being provided with a storage device, each for collecting data requested by a corresponding user and storing the data into said storage device as a replica partially replicating said database; and

a network for connecting said client devices to said server respectively via an associated data collector,

wherein each of said data collectors comprises:

a replica creation control means for determining whether a new replica of said database is to be created and stored in said storage device, in response to a replica creation request from a corresponding client device, by referring to a replica management table which holds replica descriptions at

least including a data range and a data updating interval of each replica stored in the storage device, and

a query analysis unit for analyzing a query processing request from one of said client devices to select, as an object to be searched, a replica stored in said storage device according to a query analysis result term from said query analysis unit,

a query processing unit for searching said replica stored in said storage device according to a query analysis result from said query analysis unit, and

a communication control unit for selecting a procedure for accessing said server according to said query analysis result, and

wherein said server comprises:

a communication control unit for receiving said query analysis result transmitted from said data collector, and

a query processing unit for searching the database of said server.

37. A data warehouse system according to claim 36, wherein said replica management table further holds additional replica descriptions including a data range, a data updating interval and a location of each replica stored in storage device of cooperative data collectors, and

wherein said replica creation control means determines whether a new replica of said database is to be created and stored or not, by further referring to additional replica descriptions.

IX. EVIDENCE APPENDIX

There is no evidence relied upon in this Appeal.

X. RELATED PROCEEDINGS APPENDIX

There are no related proceedings